

MULLINS, D.  
Serial No. unknown  
national phase of PCT/GB00/02294

**REMARKS**

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page(s) is captioned "**Version With Markings To Show Changes Made.**"

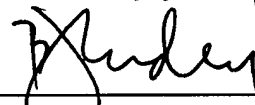
Also attached is a copy of a letter dated November 13, 2001 submitted to the EPO requesting the above amendments. These amendments have been made above out if abundance of caution to ensure their entry and consideration. The office is requested to contact the undersigned if anything further is required in this regard.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION

Page 1, before the first line, insert as a separate paragraph:

This application is the U.S. national phase of international application  
PCT/GB00/02294 filed 13 June 2000, which designated the U.S..

Please replace the paragraphs beginning at page 4, line 1:

network, it might be thought that the invention could be implemented simply by  
providing a look-up table mapping each user terminal IMSI to a switch node. However,  
this is unsatisfactory because, for security reasons, the majority of registrations with the  
network do not involve the transmission of the IMSI. Instead, on registration, a  
Temporary International Mobile Subscriber Identity is allocated, and used in future  
registrations where possible. For security reasons, the TMSI is uncorrelated with the  
identity of the user or terminal and hence, it is unsuitable for the purposes of the  
invention.

According to a further aspect of the invention, therefore, the data transmitted is  
indicative of the switch node to be used, rather than the user. Thus, security is  
maintained.

Particularly preferably, the data comprises an indication of the last switch used by  
the terminal, together with a flag indicating that that switch is to be used again. Thus, the  
data can be present in signals both from terminals which require use of a specific switch  
node and terminals which do not, the latter sending a different flag value to indicate that

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use of the previous switch node is not mandatory.

Thus, the invention is able to allow certain terminals to select use of a 20 switch node which will give simpler connection, since it is closer to the source or destination of most of their calls. Further, where (as described in our earlier application number EP 0808037) traffic is carried on the terrestrial

Please replace the paragraphs beginning at page 6, line 1:

Figure 5 illustrates schematically the disposition of satellites forming part of Figure 1 in orbits around the Earth;

Figure 6 illustrates the data rates carried between components on Earth;

Figure 7 is a flow diagram showing schematically the process performed by the network on initial registration of a terminal;

Figure 8 (comprising Figures 8a and 8b) is a flow diagram showing the process performed in the network to allocate a temporary identification;

Figure 9 (comprising Figures 9a and 9b) is a flow diagram showing the process performed by the user terminal and the network respectively on a subsequent registration; and

Figure 10 is a flow diagram modifying the process of Figure 7 in a second embodiment of the invention.

#### **FIRST EMBODIMENT**

Referring to Figure 1, a satellite communications network according to this embodiment comprises mobile user terminal equipment 2a, 2b (e.g. handsets 2a and 2b);

orbiting relay satellites 4a, 4b; satellite Earth station nodes 6a, 6b; satellite system gateway stations 8a, 8b; terrestrial (e.g. public switched) telecommunications networks 10a, 10b; and fixed telecommunications terminal equipment 12a, 12b

Interconnecting the satellite system gateways 8a, 8b with the Earth station nodes 6a, 6b, and interconnecting the nodes 6a, 6b with each other, is a

Please replace the paragraphs beginning at page 16, line 1:

by the node 6a. Alternatively, it may take place on an established signalling channel as a re-registration process initiated either by the terminal 2a or the node 6a.

In a step 1004, the IMSI is passed from the Earth station node 6a to the database station 15 via a signalling link 60. At the database station 15, the IMSI is looked up in a registration look up table. This look up process is conveniently performed in parallel with other look up operations such as the supply of authentication data from the database station 15. For each IMSI stored in the table, there is a corresponding entry indicating whether the status of the user is "normal" or "special". The significance of these entries will be discussed below. The entry is signalled back from the database station 15 to the node 6a.

Where (step 1006) the entry indicates that the user terminal 2a is of "normal" status, the allocation of an Earth station node proceeds (shown generally as step 1008) conventionally; it may be based, for example, on a comparison of the position of the mobile user (determined, as discussed above by delay and Doppler measurements) and

the position of the nodes 6, to allocate the mobile user to the closest node. Alternatively, it may be based upon present and predicted link quality as disclosed in our earlier application WO 96/16488, incorporated herein in its entirety by reference.

For international mobile subscriber identities where the subscriber is indicated as having "special" status, an additional entry is stored in the table.

Please replace the paragraphs beginning at page 20, line 1.

Accordingly, in step 1216, the node 6a determines the state of the flag. If set, the last used node 6b is re-allocated to the user terminal 2a, and a signalling link is set up to that node 6b which then controls the subsequent call via the satellite base station portion 22 of the node 6a, as discussed above.

On the other hand (step 1216), if the flag is not set, a suitable node is allocated (for example node 6c or 6d) in step 1218, in the same fashion as in step 1008 of Figure 7. The new allocated node receives from the communicating node 6a the identity of the last allocated node, to enable the retrieval of authentication and other data for communication with the user terminal 2a in known fashion.

Thus, a one bit flag can be used, together with the identity of the last registered node, to ensure that the satellite network always allocates the same node 6b to the user terminal 2a. The user terminal 2a does not itself need to store or generate any special data indicating that it falls into a particular category, or indicating what the identity of its allocated Earth station node should be; this information is initially derived from the

subscriber identity number (IMSI) by the system, and then passed back to be temporarily held on the user terminal 2a between subsequent re-registrations.

In this fashion, it is not necessary to repeatedly send the IMSI over the 20 air, which improves confidentiality and security of communication.

### IN THE CLAIMS

1. (Amended) A method of registering a satellite telephony user terminal with a system comprising one or more earth stations for communication with said user terminal via one or more satellites; ~~and one or more switch nodes interconnected therewith by a terrestrial network;~~ the method comprising;

~~receiving, from the~~ storing terminal, data for each terminal idicating a switch node allocation mode for the terminal, control data which is not based upon the dialled number, specifying a switch node to be used for communication

with that terminal; and

allocating that switch node as the node via which calls to and from the user terminal

should be directed using the terminal data and the control data.

2. (Amended) The method of claim 1, further comprising;

~~determining whether said data is present, and if not;~~

~~allocating a said switch node on other criteria.~~ sending, to the terminal, said control

data to be retransmitted therefrom in future, said control data depending upon

3. (Amended) The method of claim 21. further comprising;  
  
determining whether the position of said data is present, and if not; user terminal;  
  
and  
  
allocating a said switch node on the other criteria basis of said position and that of  
  
the switch  
  
nodes.

4. (Amended) The method of any preceding claim 3, further comprising, in a first  
  
allocation mode; determining the position of said user terminal; and  
  
allocating a said switch node on the basis of said position and that of the switch  
  
nodes, which the data comprises;  
  
an indication of the last switch node allocated to said user terminal.

5. (Amended) The method of claim 4 appended to claim 2, in which the control data  
  
further comprises;

an indication of the whether said last switch node allocated to said user  
  
terminal should be used again or not.

6. (Amended) The method of any preceding claim 1, in which the control data  
  
comprises; further comprising the steps of;

~~receiving, from the terminal, data indicative of the identity of the user  
or the user terminal;~~

~~determining therefrom a switch node to be used for communication 10 with  
that terminal; and~~

~~allocating that switch node as the node via which calls to and from the user  
terminal should be directed; an indication of whether the last switch node allocated to said  
user terminal should be used again or not.~~

7. (Amended) ~~A method of registering a satellite telephony user terminal with a  
system comprising one or more earth stations for communication with said user terminal  
via one or more satellites; and one or more switch nodes interconnected therewith by a  
terrestrial network; the method comprising;~~

~~determining whether data has been received from the terminal, which is indicative  
of the identity of the user or the user terminal;~~

~~if so;~~

~~determining therefrom a switch node to be used for communication with that  
terminal; and~~

~~allocating that switch node as the node via which calls to and from the user  
terminal should be directed;~~

~~if not;~~

~~determining whether data has been received from the terminal, which is indicative~~

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~~of a switch node to be used for communication with that terminal~~

~~and not of the identity of the user or the user terminal; and~~

~~allocating that switch node as the node via which calls to and from the user  
terminal should be directed;~~

~~if not;~~

~~allocating a said switch node on other criteria.~~The method of claim 1, further comprising  
the steps of,

receiving, from the terminal, data indicative of the identity of the user  
or the user terminal;

determining therefrom a switch node to be used for communication  
with that terminal; and

allocating that switch node as the node via which calls to and from the user  
terminal  
should be directed.

8. A method of registering a satellite telephony user terminal with a system  
comprising one or more earth stations for communication with said user terminal via one  
or more satellites; and one or more switch nodes interconnected therewith by a terrestrial  
network; the method comprising;

determining whether data has been received from the terminal, which is  
indicative of  
the identity of the user or the user terminal; if so, operating a third switch node allocation

mode comprising,

determining therefrom a switch node to be used for communication with that

terminal; and

allocating that switch node as the node via which calls to and from the user

terminal

should be directed;

if not, operating a first switch node allocation mode comprising;

determining whether control data (other than the dialled number), has been

received

from the terminal, which is indicative of a switch node to be used for communication

with that terminal and not of the identity of the user or the user terminal; and

allocating that switch node as the node via which calls to and from the user

terminal

should be directed;

if not, operating a second switch node allocation mode comprising;

allocating a said switch node on other criteria.

9. (Amended) ~~A network control component of a mobile satellite communications system comprising one or more earth stations for communication with a satellite telephony user terminal via one or more satellites and one or more switch nodes interconnected therewith by a terrestrial network; said component being operable to register a said user terminal with said system; the component comprising; means for~~

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~~receiving, from the terminal, data specifying a switch node to be used for communication with that terminal; and means for allocating that switch node as the node via which calls to and from the user terminal should be directed. A method according to claim 1, in which the one or more satellites~~  
comprise a constellation of satellites in non-geostationary orbits.

10. (Amended) A user terminal for a satellite communications system, said terminal being operable to transmit control data which is not based upon the dialled number, specifying a switch node to be used for communication with that terminal, said data being indicative of the identity of said switch node and not of the identity of the user or the user terminal.~~The component of claim 9 which comprises one of said earth stations.~~

11. (Amended) A user terminal according to claim 10, which is arranged to receive said control data, store said control data, and subsequently to transmit said stored control data.~~The component of claim 9 or claim 10, which further comprises one of said switch nodes.~~

12. (Amended) A network control component of a mobile satellite communications system comprising one or more earth stations for communication with a satellite telephony user terminal via one or more satellites and one or more switch nodes interconnected therewith by a terrestrial network; said component being operable to register a said user terminal with said system; the component comprising;

means for receiving, from the terminal, control data which is not based upon the  
dialled number), specifying a switch node to be used for communication with that  
terminal; and

means for allocating that switch node as the node via which calls to and from the  
user  
terminal should be directed .A satellite system network component for performing the  
process of any of claims 1 to 7.

Please add new claims 13-15.

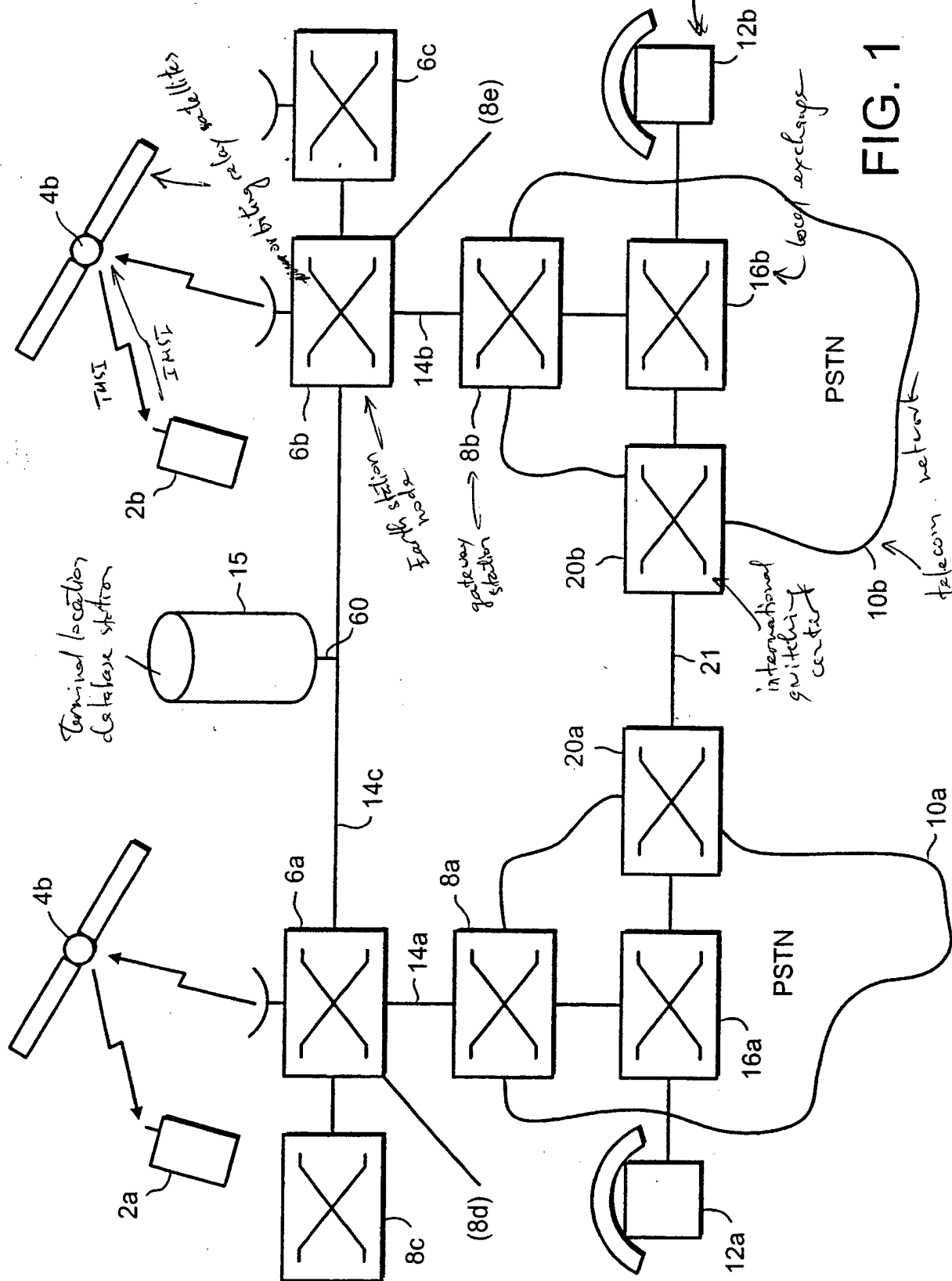
13. (New) The component of claim 12 which comprises one of said earth stations.

14. (New) The component of claim 12, which further comprises one of said switch  
nodes.

15. (New) A satellite system network component for performing the process of claim  
1.

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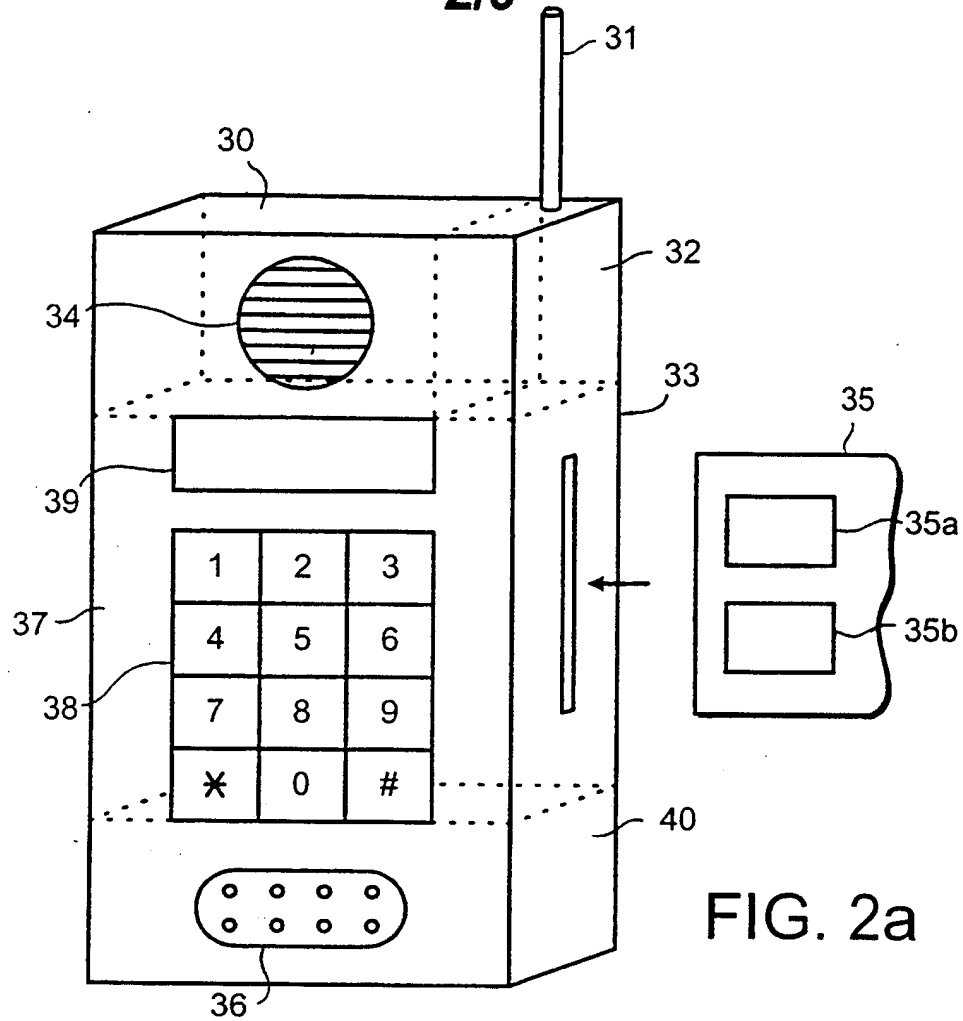


FIG. 2a

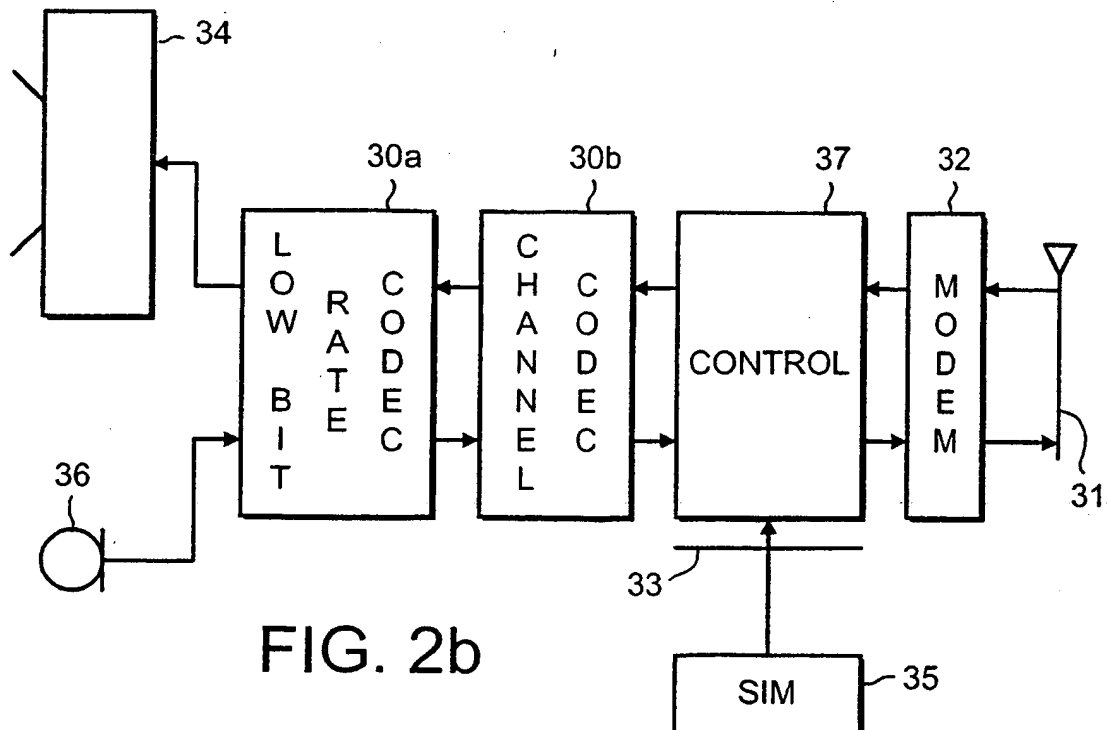


FIG. 2b

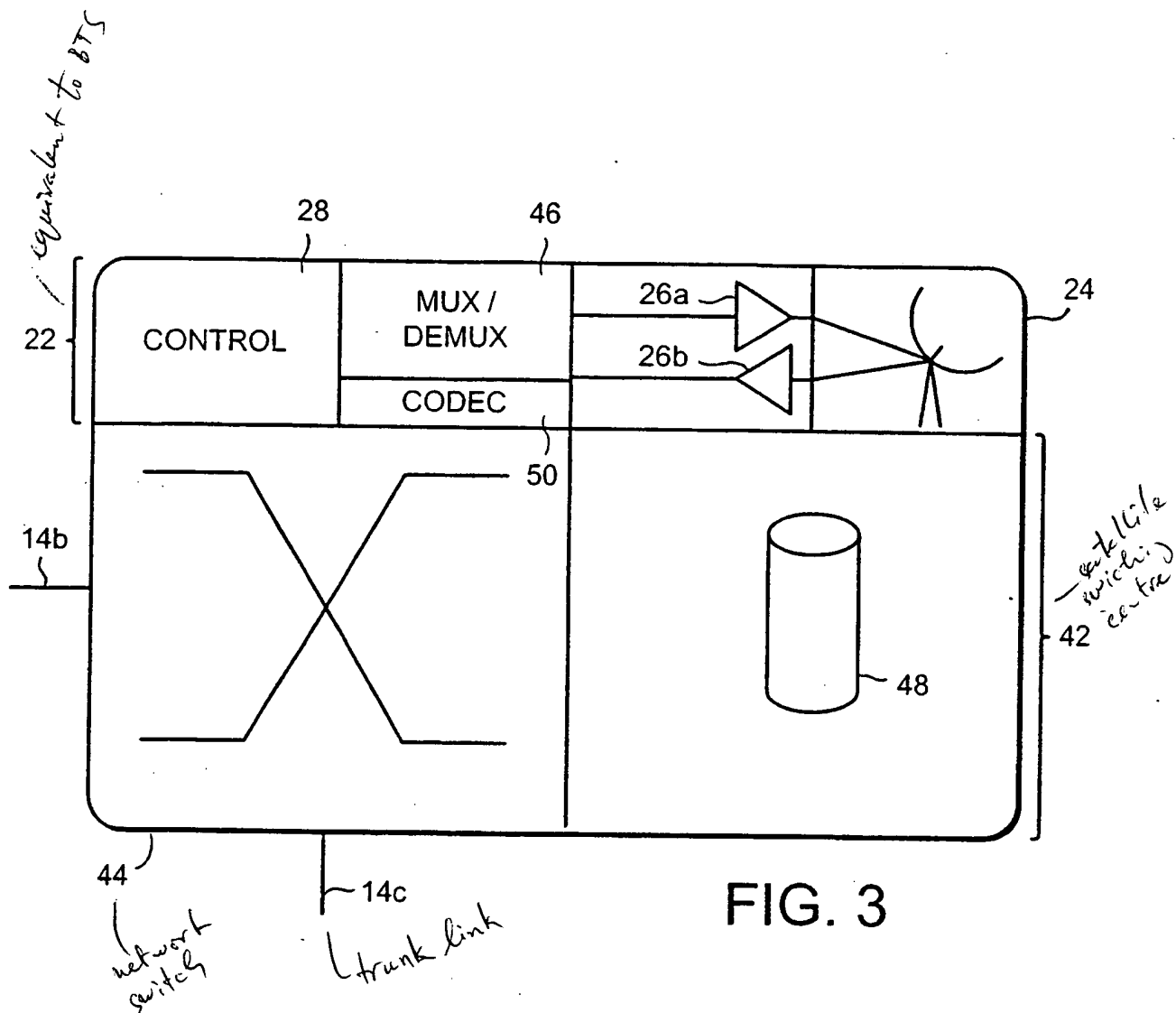
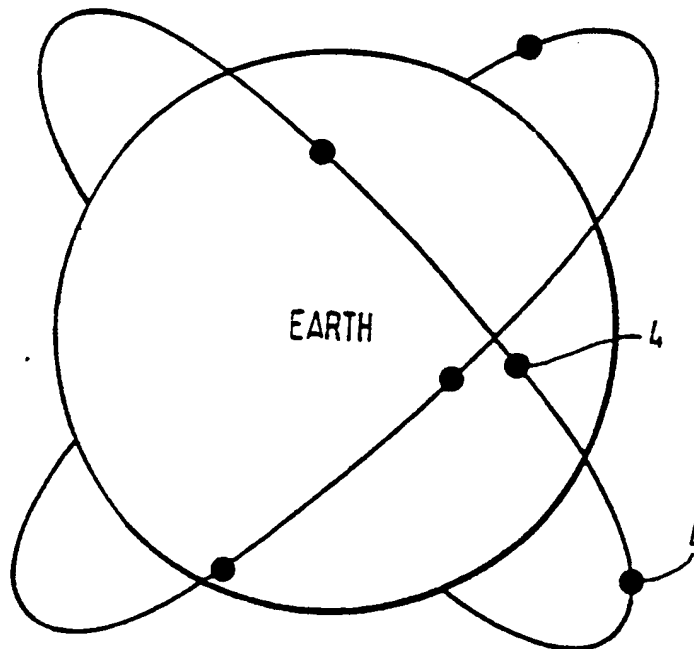
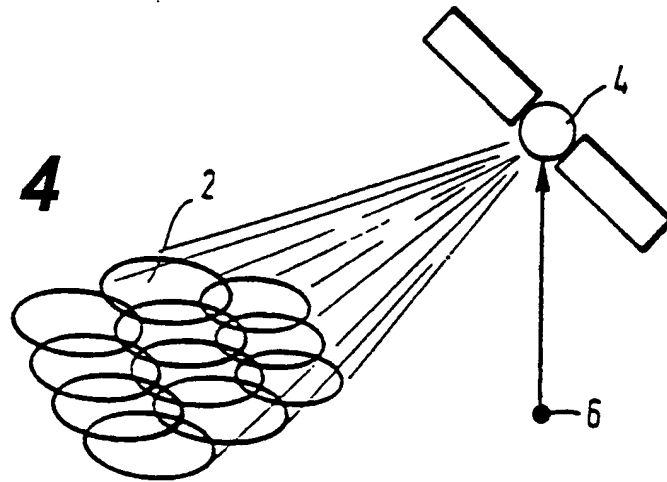


FIG. 3

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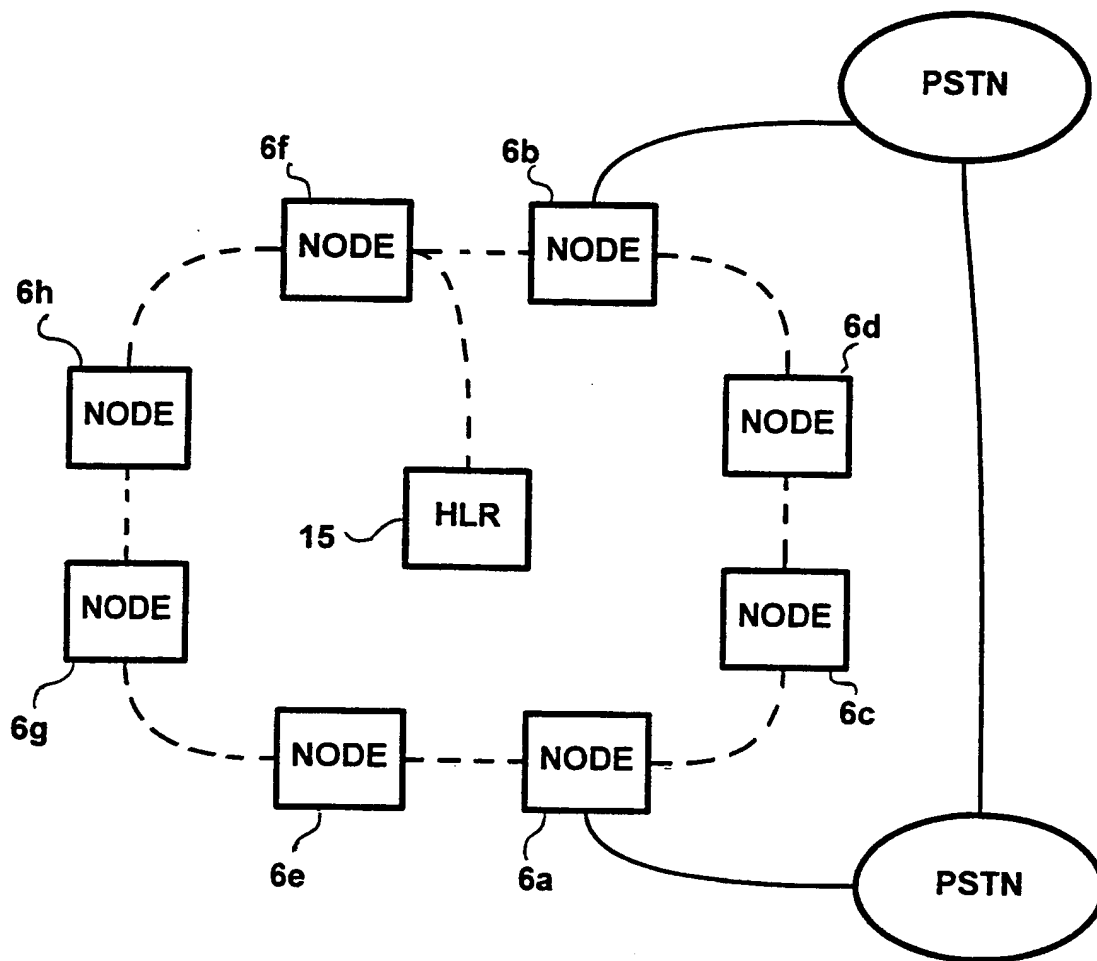
**FIG. 4**

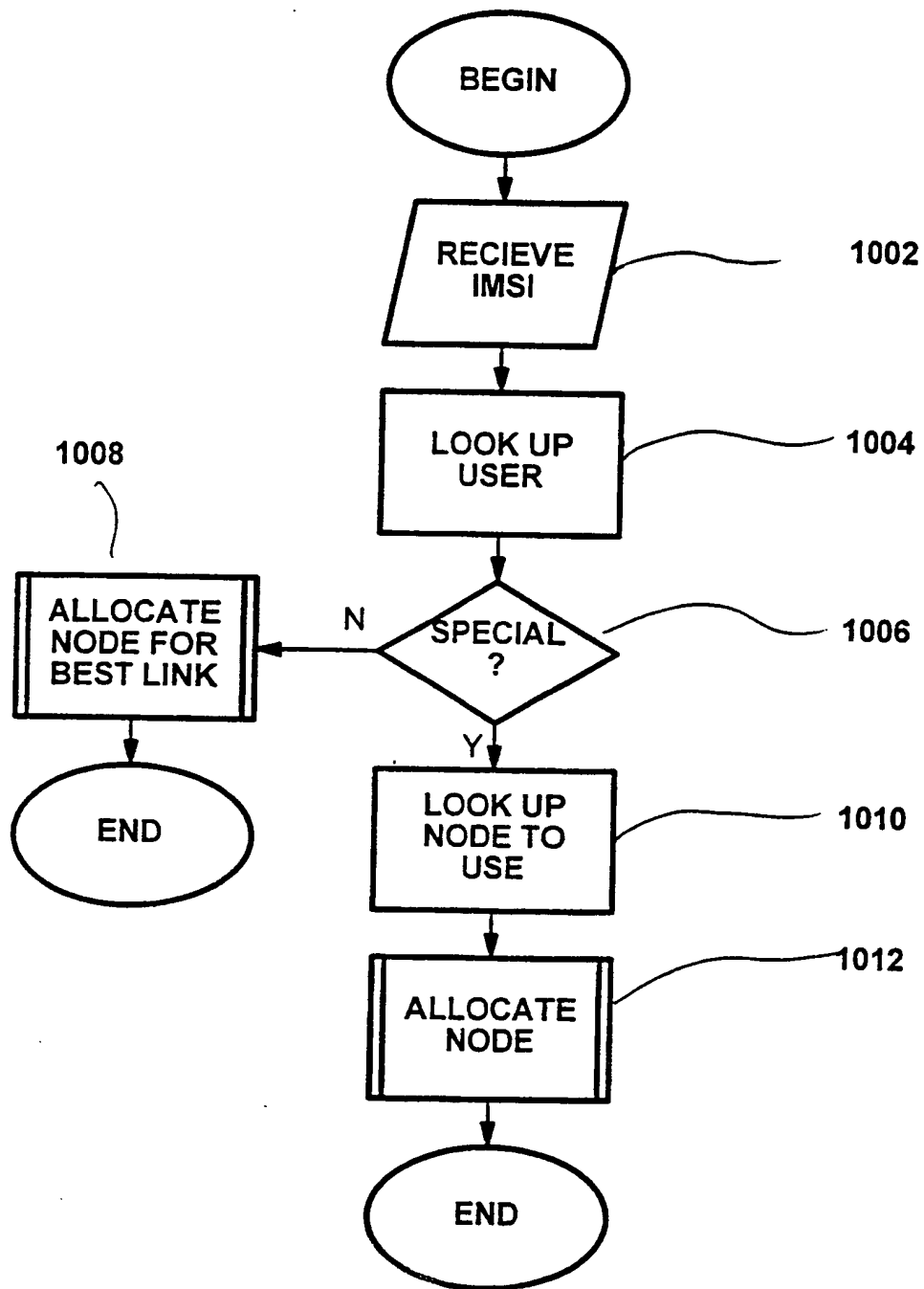


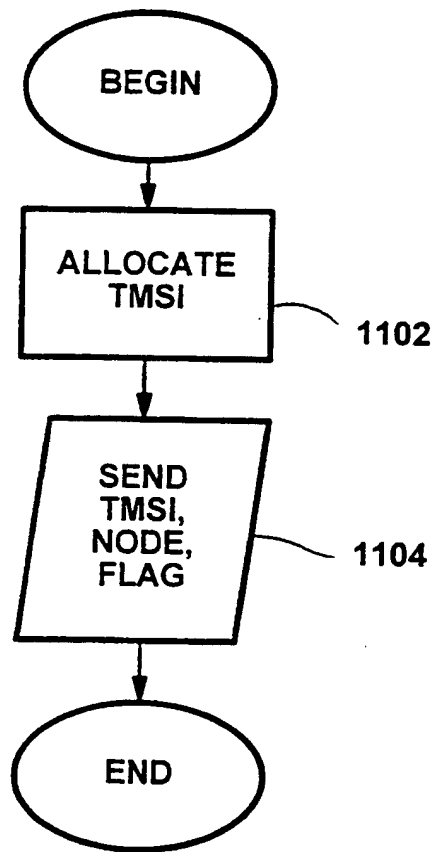
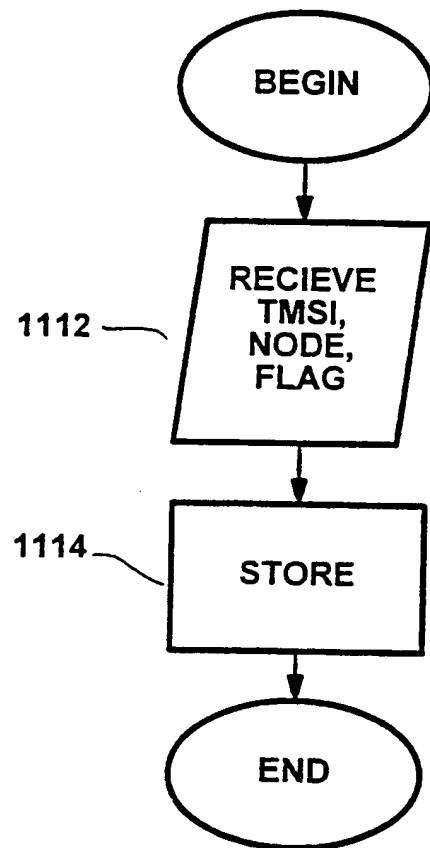
**FIG. 5**

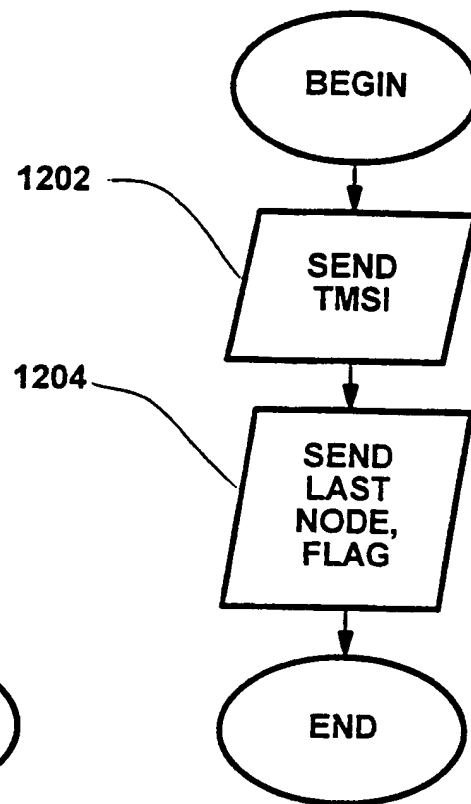
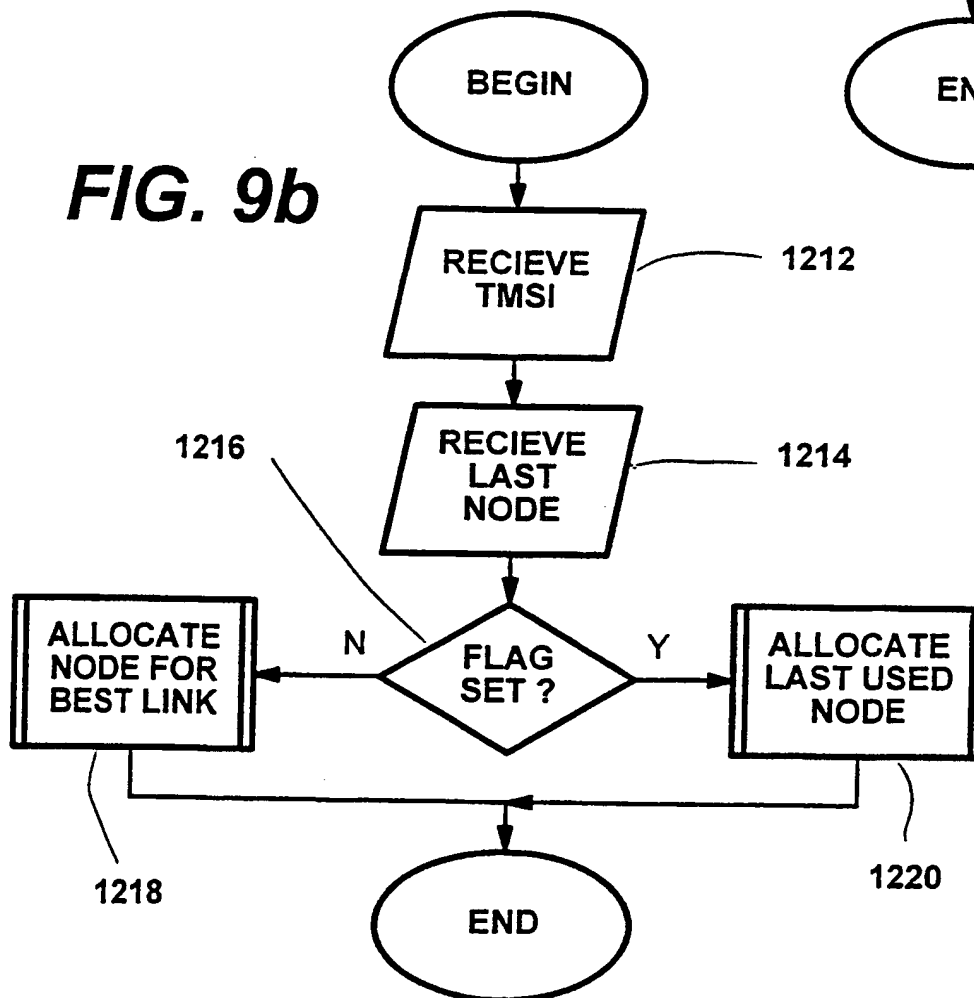


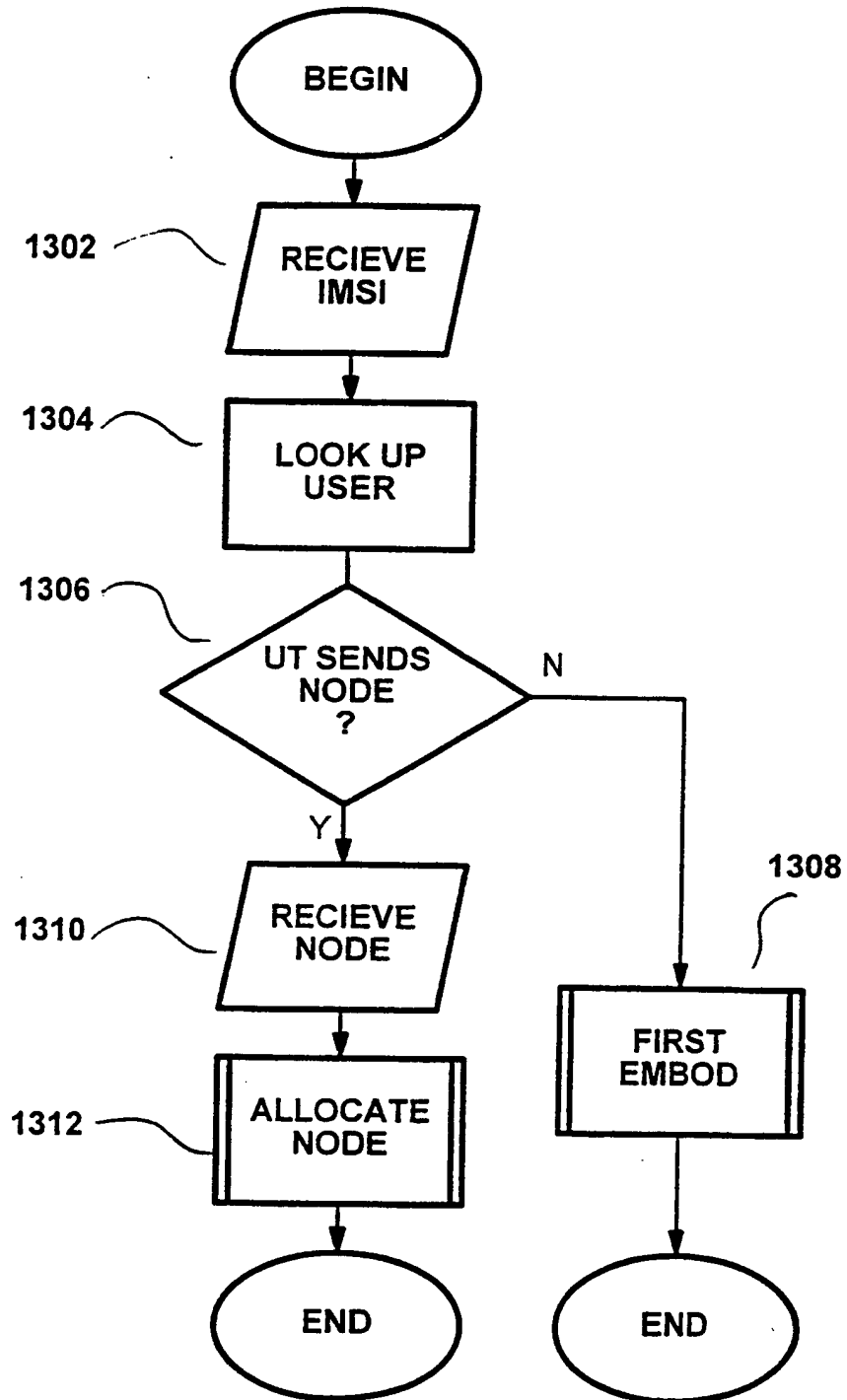
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**FIG. 6**

**FIG. 7**

**FIG. 8a****FIG. 8b**

**FIG. 9a****FIG. 9b**



**FIG. 10**

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